



Cyberscope

Audit Report

**Web23**

August 2022

Github <https://github.com/raahul-web23/HbarSmartContract>

Commit [0xEE09b0711305B797F553a8336068bB4b3BE0063e](https://github.com/raahul-web23/HbarSmartContract/commit/0xEE09b0711305B797F553a8336068bB4b3BE0063e)

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## Contract Review

<b>Contract Name</b>	DomainWeb23
<b>Compiler Version</b>	v0.8.11+commit.d7f03943
<b>Github</b>	<a href="https://github.com/raahul-web23/HbarSmartContract">https://github.com/raahul-web23/HbarSmartContract</a>
<b>Commit</b>	20efdd10cd7146915fbe0a7f49192660201b2d26
<b>Unit Tests</b>	<a href="https://github.com/cyberscope-io/audits/tree/main/web23/tests">https://github.com/cyberscope-io/audits/tree/main/web23/tests</a>
<b>Testing Deploy</b>	<a href="https://bscscan.com/token/0xEE09b0711305B797F553a8336068bB4b3BE0063e">https://bscscan.com/token/0xEE09b0711305B797F553a8336068bB4b3BE0063e</a>

## Audit Updates

<b>Initial Audit</b>	12th August 2022 <a href="https://github.com/cyberscope-io/audits/tree/main/web23/v1/audit.pdf">https://github.com/cyberscope-io/audits/tree/main/web23/v1/audit.pdf</a>
<b>Corrected phase 1</b>	18th August 2022
<b>Corrected phase 2</b>	25th August 2022

## Source Files

Filename	SHA256
<b>DomainWeb23.sol</b>	a22d9bbf506fe2577be85a52e3e689fb2efd7053414077d46d04ebf8c7555193
<b>HederaResponse Codes.sol</b>	23d77e84bd8c92ed5f5f52491cc83abae4d690cdcba547130dd5d24f56c6035a
<b>HederaTokenService.sol</b>	3a5047606a5e170530b55eddae4cca72ce3d8f59e8fe8b63c0b30275529b79d6

**IHederaTokenService.sol**081b85a32145744dd00d13943562c729387bb6141d9f3  
6c758f73d25b1eaba41

## Audit Scope

The audit focuses on the DomainWeb23 contract. The token processing operations like mint, associate are delegated to an external contract that is out of the audit scope. The payment methods in the DomainWeb23 are not calling back the sender, but the delegation calls to HederaTokenService address are passing the sender's address. We assume that the contract owner is a trusted address and does not handle the receive payment method. Hence, the contract is not vulnerable for a reentrance attack by the DomainWeb23 methods. On the other hand, it may produce potential vulnerabilities if the HederaTokenService is calling back the original sender.

# Unit Tests

As an integral part of the auditing process, 15 scenarios were scripted to test the contract's functionality. Additionally, a scenario has been implemented where multiple users try to buy one domain.

## Implementation

<https://github.com/cyberscope-io/audits/tree/main/web23/tests>

## Business Scenarios

- Should receive a payment and mint successfully (1,6)
- Should setDomainAsset successfully (1,2)
- Should return empty value in an unregistered domain (1)
- Should check if domain exist
- Should check if sender is the owner
- Should blacklist a domain (3)
- Should not allow an unregistered domain
- Should allow a registered domain (4,7)
- Should update the site address (5,7)
- Should update the site address only from owner (5)
- Should not allow changing an unregistered site address (5)
- Should book a domain when payment received (6)
- Should get all registered domains (8)
- Should check that domain exists (9)
- Should receive multiple payments (7,9,10)

## Multiple Users Scenario

- Register multiple wallets the same domain

# Contract Analysis

● Critical   ● Medium   ● Minor   ● Pass

Severity	Code	Description	Status
●	BLC	Business Logic Concern	Acknowledged
●	ZAA	Zero Address Association	
●	L04	Conformance to Solidity Naming Conventions	Acknowledged

## BLC - Business Logic Concern

<b>Criticality</b>	medium
<b>Location</b>	contract.sol#L85
<b>Status</b>	Acknowledged

### Description

The contract is using a variable that is always set with the zero value. This variable is passed to the 'mintToken()' method. So the contract always executes the 'mintToken()' method with zero amount. The specification of the mintToken states the following:

```
@param amount Applicable to tokens of type FUNGIBLE_COMMON. The amount to mint to the Treasury Account.  
Amount must be a positive non-zero number represented in the lowest denomination of the token. The new supply must be lower than 2^63.
```

The actual argument of the 'mintToken()' method comes into conflict with the method specification.

```
uint64 _amount=0;  
string memory domName=hashToDomainInfo[_hash].domainName;  
uint256 ii=indexOf(domName,".");  
address domainOwner=hashToDomainInfo[_hash].domainOwnerAddress;  
string memory parentBtld=substring(domName,ii+1);  
(int response, uint64 newTotalSupply, int64[] memory serialNumbers) =  
HederaTokenService.mintToken(btldToTokenAddress[parentBtld], _amount,  
_metadata);
```

### Recommendation

The team is advised to carefully check if the implementation follows the expected business logic.



## Team Update (18/08)

This is a default behavior of HTS, NFTMinting Engine, where 0 is passed as amount while NFT is minted.

## ZAA - Zero Address Association

<b>Criticality</b>	minor
<b>Location</b>	contract.sol#L152
<b>Status</b>	

### Description

The contract is allowing token association with the zero address. According to the mintToken specification, if a token does not exist, the transaction results in INVALID\_TOKEN\_ID. This may happen if the caller provide a domain that both the top level domain and the second level domain are not registered.

```
address
btldToken=btldToTokenAddress[parentBtld]==address(0x0)?btldToTokenAddress[substr
ing(parentBtld,indexOf(parentBtld,"")+1):btldToTokenAddress[parentBtld];
...
HederaTokenService.associateToken(msg.sender, btldToken);
```

According to the HederaTokenService specification:

```
/// Associates the provided account with the provided tokens. Must be signed by
the provided
/// Account's key or called from the accounts contract key
/// If the provided account is not found, the transaction will resolve to
INVALID_ACCOUNT_ID.
```

### Recommendation

The contract could embed a check for not allowing associations with the zero address.

## L04 - Conformance to Solidity Naming Conventions

<b>Criticality</b>	minor
<b>Location</b>	contracts/DomainWeb23.sol#L64,68,72,76,95,130,167,171,180,203,208,220,226,230,238,242,15
<b>Status</b>	Unresolved

### Description

Solidity defines a naming convention that should be followed. Rule exceptions:

- Allow constant variable name/symbol/decimals to be lowercase.
- Allow `_` at the beginning of the mixed\_case match for private variables and unused parameters.

```
_blacklistedAddress  
_whitelistedAddress  
_hash  
_metadata  
_domainNames  
_userAddress  
_domainName  
_siteAddress  
_btld  
...
```

### Recommendation

Follow the Solidity naming convention.

<https://docs.soliditylang.org/en/v0.4.25/style-guide.html#naming-conventions>.

### Team Update (18/08)

We have used `_variable` for function parameters

# Contract Functions

Contract	Type	Bases		
	Function Name	Visibility	Mutability	Modifiers
<b>DomainWeb23</b>	Implementation	HederaTokenService		
	<Constructor>	Public	✓	-
	substring	Private		
	addBlackList	External	✓	onlyOwner
	setMinimumPrice	External	✓	onlyOwner
	removeBlackList	External	✓	onlyOwner
	addWhiteList	External	✓	onlyOwner
	removeWhiteList	External	✓	onlyOwner
	indexOf	Private		
	mintNonFungibleToken	External	✓	onlyOwner
	receivePaymentMultiple	External	Payable	-
	getBookingDomainHash	External		-
	getAllDomains	External		-
	getDomainInfo	External		-
	transferNft	Internal	✓	
	isDomainAvailable	External		-
	updateSiteAddress	External	✓	-
	enableBtld	External	✓	onlyOwner
	disableBtld	External	✓	onlyOwner
	setDomainAsset	External	✓	-
	getDomainAsset	External		-
	releaseDomain	External	✓	onlyOwner
<b>HederaResponseCodes</b>	Implementation			
<b>HederaTokenService</b>	Implementation	HederaResponseCodes		

	cryptoTransfer	Internal	✓	
	mintToken	Internal	✓	
	burnToken	Internal	✓	
	associateTokens	Internal	✓	
	associateToken	Internal	✓	
	dissociateTokens	Internal	✓	
	dissociateToken	Internal	✓	
	createFungibleToken	Internal	✓	
	createFungibleTokenWithCustomFees	Internal	✓	
	createNonFungibleToken	Internal	✓	
	createNonFungibleTokenWithCustomFees	Internal	✓	
	transferTokens	Internal	✓	
	transferNFTs	Internal	✓	
	transferToken	Internal	✓	
	transferNFT	Internal	✓	
<b>IHederaTokensService</b>	Interface			
	cryptoTransfer	External	✓	-
	mintToken	External	✓	-
	burnToken	External	✓	-
	associateTokens	External	✓	-
	associateToken	External	✓	-
	dissociateTokens	External	✓	-
	dissociateToken	External	✓	-
	createFungibleToken	External	Payable	-
	createFungibleTokenWithCustomFees	External	Payable	-
	createNonFungibleToken	External	Payable	-
	createNonFungibleTokenWithCustomFees	External	Payable	-
	transferTokens	External	✓	-
	transferNFTs	External	✓	-
	transferToken	External	✓	-
	transferNFT	External	✓	-

# Contract Flow



## Summary

Web23 implements domain registration functionality based on web3. This audit focuses on the potential vulnerabilities, business logic concerns and suggested improvements. A batch of scenarios and unit tests have been implemented in order to validate the business logic and the flows.

# Disclaimer

All the content provided in this document is for general information only and should not be used as financial advice or a reason to buy any investment.

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# About Cyberscope

Coinscope audit and K.Y.C. service has been rebranded to Cyberscope.

Coinscope is the leading early coin listing, voting and auditing authority firm. The audit process is analyzing and monitoring many aspects of the project. That way, it gives the community a good sense of security using an informative report and a generic score.

Cyberscope and Coinscope are aiming to make crypto discoverable and efficient globally. They provide all the essential tools to assist users draw their own conclusions.



The Cyberscope team

<https://www.cyberscope.io>